

Alg. 2 Warm Up #11-3

Solve. $0 < x \leq 2\pi$

1. $4 \sin^2 x = 3$ 2. $3 \cos x = 2$

HW Questions: page CP27

9) $\frac{3}{x} + \frac{5}{x-7} = -2$

$$\frac{5}{x-7} = -\frac{2x}{x} - \frac{3}{x}$$

$$\frac{5}{(x-7)} = \left(-\frac{2x-3}{x} \right)$$

Now
cross
multiply
"

$$10) \left(\frac{2x+3}{4} - \frac{x-7}{6} \right) = \frac{2x-3}{12} \cdot \frac{12}{1}$$

$$3(2x+3) - 2(x-7) = 2x-3$$

↓

More Trig Notes:

If $\sin x = \frac{1}{4}$, find the exact $\cos x$.

SOHCAHTOA

Using the Pythagorean Identity:

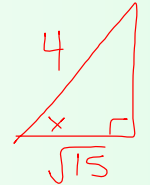
or draw a triangle:

$$\sin^2 x + \cos^2 x = 1$$

$$\left(\frac{1}{4}\right)^2 + \cos^2 x = 1$$

$$\sqrt{\cos^2 x} = \sqrt{\frac{15}{16}}$$

$$\cos x = \pm \frac{\sqrt{15}}{4}$$

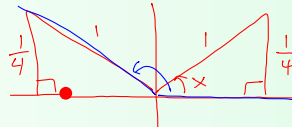


$$\cos x = \frac{\sqrt{15}}{4}$$

$$\sin x = \frac{1}{4}, \text{ the exact } \cos x = \pm \frac{\sqrt{15}}{4}$$

Since the sine is positive, in which quadrant will the angle x be?

Quad I or II



Do we need both the positive and the negative answers for the cosine of x ? yes!
cos + QI
cos - QII

Find x to the nearest tenth for $0 < x < \pi$

$$x = \sin^{-1}\left(\frac{1}{4}\right) \quad (\text{Calculate in radian mode})$$

$$x \approx 0.25$$

← angle in quad I

$$x = \pi - \theta'$$

← QII angle
 $(\theta' \approx 0.25)$

$$x \approx 2.89$$

Solve, exact answers:

1) $2 \cos x + 1 = 0$

2) $2 \sin^2 x - 1 = 0$

Solve, exact answers:

1) $2 \cos x + 1 = 0$

$$2 \cos x = -1$$

$$\cos x = -\frac{1}{2}$$

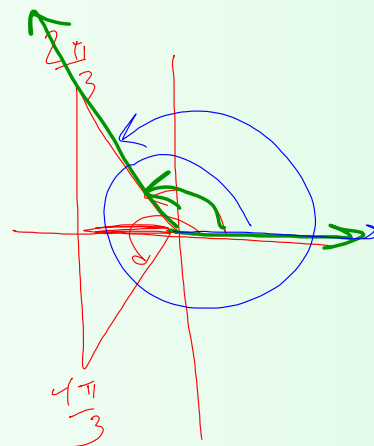
$$\text{on } 0 \leq x < 2\pi$$

$$x = \frac{2\pi}{3}, \frac{4\pi}{3}$$

$$x = \frac{2\pi}{3} + 2\pi n,$$

$$\frac{4\pi}{3} + 2\pi n$$

2) $2 \sin^2 x - 1 = 0$

General
Solution

Solve, exact answers:

1) $2 \cos x + 1 = 0$

2) $2 \sin^2 x - 1 = 0$

$$2 \sin^2 x = 1$$

$$\sqrt{\sin^2 x} = \sqrt{\frac{1}{2}}$$

$$\sin x = \pm \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

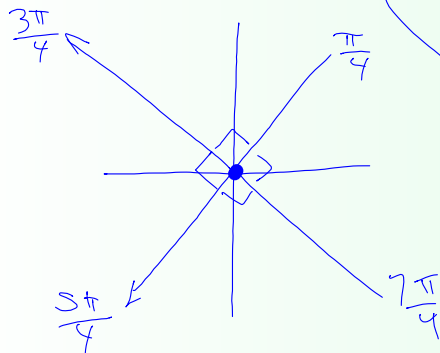
$$\sin x = \pm \frac{\sqrt{2}}{2}$$

General Solution:

$$x = \frac{\pi}{4} + \frac{\pi}{2}n$$

on $0 \leq x < 2\pi$

$$x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$



HW: Chapter 12

12 - # 6, 10, 15, 29,

33, 42, 45